

Claims

1. A method for location management in a cellular telecommunication system supporting macro diversity connections, **characterised** in that, regarding a macro diversity situation it comprises the steps of:
- 5 - assigning priority levels to the cells of an active set of a macro diversity connection, and
- at least partly based on the priority levels, determining a cell to be used as the location of the mobile station.
- 10 2. A method according to claim 1, **characterised** in that each of the cells used in a macro diversity connection between a mobile station and the network is classified as being in a serving cell set or outside said serving cell set.
- 15 3. A method according to claim 2, **characterised** in that one of the cells in the serving cell set is selected to be a master cell.
- 20 4. A method according to claim 3, **characterised** in that said selection is performed by the network.
- 25 5. A method according to claim 4, **characterised** in that the network performs the selection of the master cell as a response to a message received from the mobile station, which message does not contain an indication of a master cell.
- 30 6. A method according to claim 3, **characterised** in that said selection is performed according to a predefined rule.
7. A method according to claim 6, **characterised** in that the cell of the serving cell set which has been in the active set for the longest time is selected to be the master cell.
- 35 8. A method according to claim 3, **characterised** in that said selection is performed by the mobile station.
9. A method according to claim 8, **characterised** in that the cell selected by the mobile station is indicated to the network in a message sent by the mobile station.

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10. A method according to claim 8, **characterised** in that
- the mobile station requests location information from the network,
 - the mobile station receives a response to the request from the network, and
 - 5 - the selection of the master cell is performed at least partly based on said response.

11. A method according to claim 8, **characterised** in that said selection is performed at least partly on the basis of information about localised services of the network stored in the mobile station.

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12. A method according to claim 1, **characterised** in that the priority levels of the cells in the active set are changed as a response to serving RNC relocation.

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13. A method according to claim 2, **characterised** in that as a response to serving RNC relocation, the cells of the active set which were designated as being in the serving cell set are designated as being outside the serving cell set, and the cells of the active set which were designated as being outside the serving cell set are designated as being in the serving cell set.

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14. A method according to claim 2, **characterised** in that the mobile station designates those cells of the active set as being in the serving cell set, which cells are listed in a message received from the network informing the mobile station about a serving RNC relocation, and designates other cells of the

25 active set as being outside the serving cell set.

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15. A method according to claim 2 used in a cellular telecommunication system comprising a first network element for controlling circuit switched connections and a second network element for controlling packet switched connections, **characterised** in that

when a mobile station has an active connection to a first of the first and second network elements and no active connections to a second of the first and second network elements,

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a location update to said second of the first and second network elements is performed at least partly as a response to a change in said serving cell set.

16. A method according to claim 15, **characterised** in that

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said location update is performed at least partly as a response to the changing of all cells in the serving cell set.

- 5 17. A method according to claim 15, characterised in that said location updates are performed at least partly as a response to removing of the last of those cells in the serving cell set, which cells were in the serving cell set when a location update was performed the previous time.

- 10 18. A method according to claim 15, characterised in that the method comprises steps, in which
- the mobile station requests location information from the network,
 - the mobile station receives a response to the request from the network, and
 - the mobile station makes a decision about whether or not to perform a location update to said second of the first and second network elements at least partly based on said response.
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- 20 19. A method according to claim 2 used in a cellular telecommunication system comprising a first network element for controlling circuit switched connections and a second network element for controlling packet switched connections, characterised in that
- when a mobile station has an active connection to a first of the first and second network elements and no active connections to a second of the first and second network elements, a location update to said first of the first and second network elements is performed at least partly as a response to a change in said serving cell set.
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- 30 20. A mobile station for a cellular telecommunication system comprising a cellular network, which mobile station has means for communicating using macro diversity connections in which the mobile station communicates with the cellular network via a plurality of cells, said means for communicating comprising receiving means, characterised in that
- the receiving means are arranged to receive information for construction of a priority order for the plurality of cells with which the mobile station communicates in a macro diversity connection, and
 - the mobile station comprises selecting means that are arranged to select a master cell to be used as the location of the mobile station at least partly on the basis of said priority order.
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21. A mobile station according to claim 20, **characterised** in that the mobile station further comprises means for indicating the selected master cell to the network.

5 22. A system for location management in a cellular telecommunication system, **characterised** in that

- the system is arranged to transmit to a mobile station information for construction of a priority order for the plurality of cells with which said mobile station communicates in a macro diversity connection, and

10 - the system is arranged to receive from a mobile station, after having transmitted to said mobile station information for construction of a priority order for the plurality of cells with which said mobile station communicates in a macro diversity connection, information specifying a master cell and to indicate the specified cell as the location of the mobile station to a core network of the cellular telecommunication system.

15 23. A system according to claim 22, **characterised** in that the system is located in a radio access network of the cellular telecommunication system.

20 24. A system according to claim 23, **characterised** in that the system is located in the radio network controller of said radio access network.

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